



NEWSLETTER OF THE LONDON CHAPTER,
ONTARIO ARCHAEOLOGICAL SOCIETY

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January 2002

02-1

February is the perennial favourite **Members Night**. There are at least four speakers lined up: Dr. Holly Martelle, Steve Timmermans, Paul O'Neal, and Dr. Andrew Nelson. Come and join us Thursday February 14th at the museum.

If anyone else would like to do a short 10 to 20 minute presentation, please contact Chris Ellis.

It's that time of year again! Time to renew your London Chapter membership. Check your mailing label for the expiry date of your Kewa subscription.

As always, our meeting will be held at 8 pm at the London Museum of Archaeology, 1600 Attawandaron Road, near the corner of Wonderland & Fanshawe Park Road, in the northwest part of the city.

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THE CRAWFORD KNOLL SITE

Ian T. Kenyon and Kristy Snarey

INTRODUCTION

The Crawford Knoll Site (AdHo-4) is located in Kent County, Ontario, near the Chenal Ecarte, the easternmost branch of the St. Clair River Delta (see Figure 1). The site is located on a 0.5 m high sand plain in an area of marshes fringed with meadows (Chapman and Putnam, 1984:151). Bone collagen from midden faunal refuse at the site has been radiocarbon dated to 3480 BP \pm 120 (TO-920), making the site one of the earliest dated "Small Point" Terminal Archaic sites in Ontario (Kenyon, 1989).

Long known to local collectors, surface examination of the site by Ministry of Culture and Recreation personnel took place in 1977 and 1978. Concentrations of bone, fire-cracked rock, and chipping detritus were detected. The site was partially excavated in 1979 under the direction of Ian Kenyon (1980b, 1980c). When the site was excavated, 47 one-metre squares were dug on the ridge or knoll in an area selected because of a dense surface concentration of surface artifacts (see Figure 2). The northernmost limits dug were at the crest of the knoll, the south end down the slope of the knoll.

Plough zone soil was stripped by shovel and the squares were troweled flat and visible features were mapped. The south end along the slope revealed a midden (Figure 3). Evidence of the midden was found in 36 of the squares. As well, six pit features were discovered on the top of the knoll, apparently in an occupation area. Midden and pit fill were screened through quarter-inch mesh. Flotation samples were taken from all features.

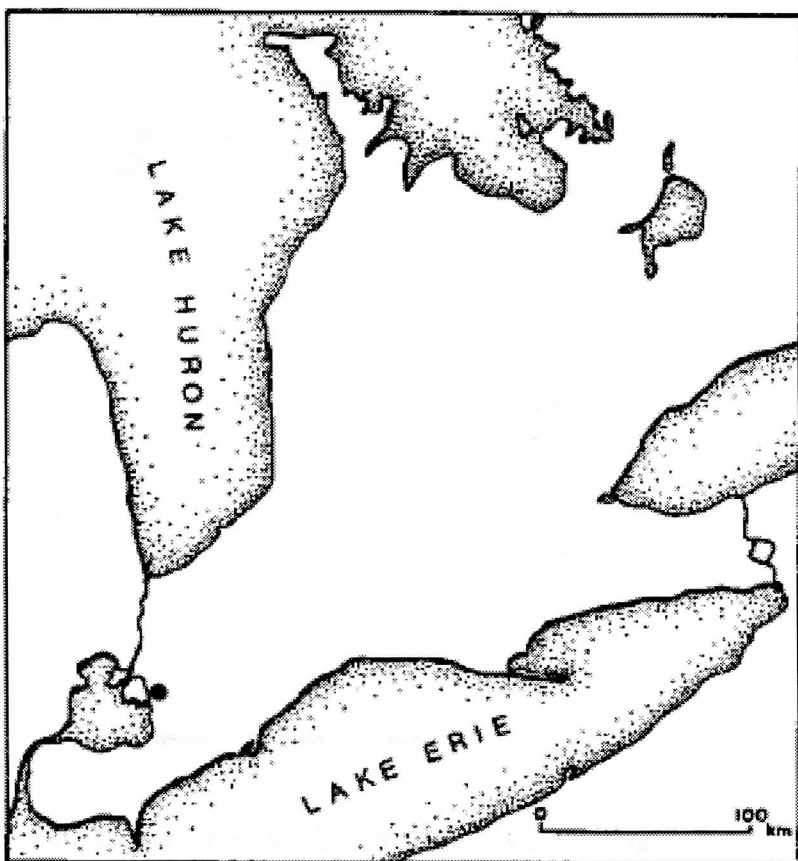


Figure 1: Location of Crawford Knoll.

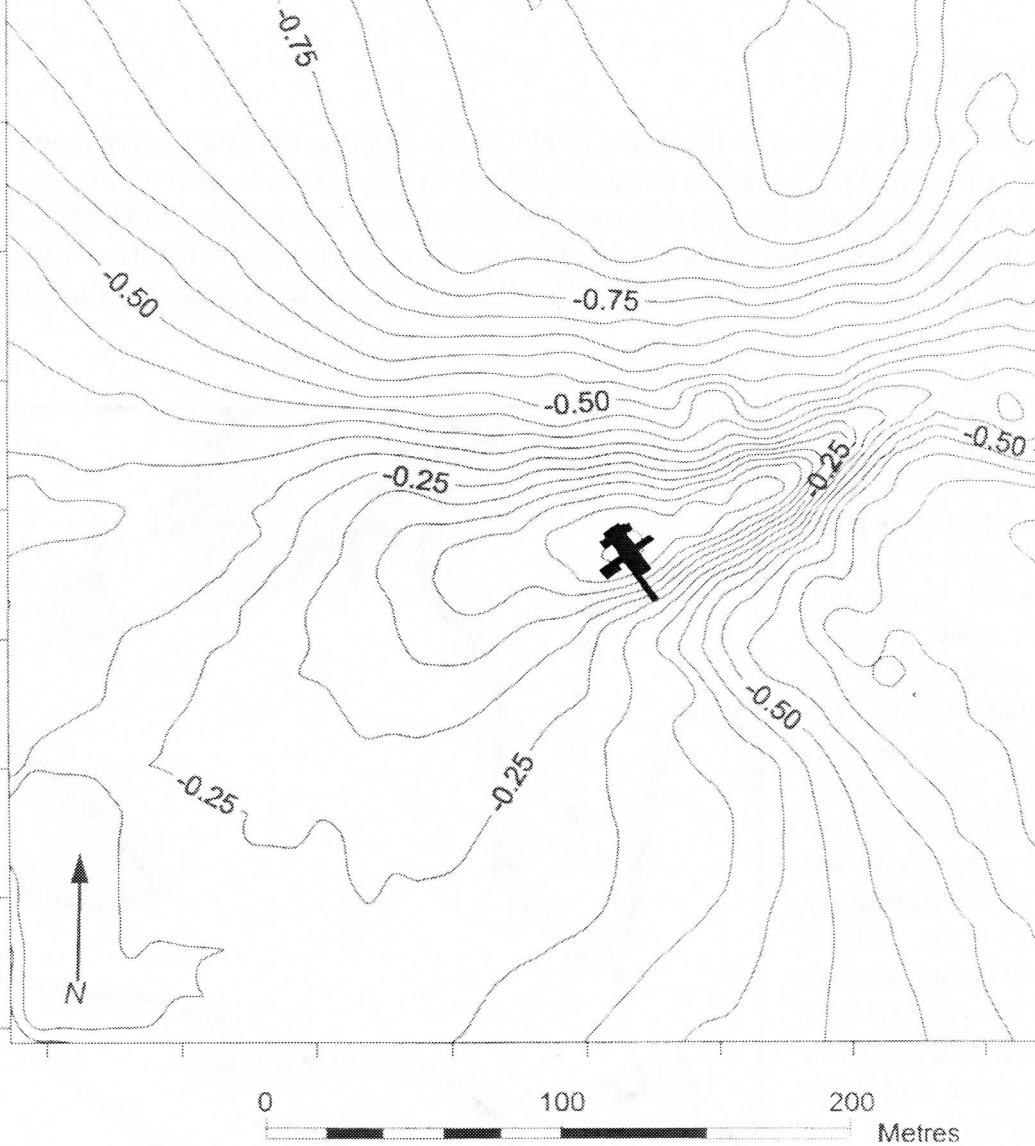


Figure 2: Contour map of Crawford Knoll and surrounding environment.

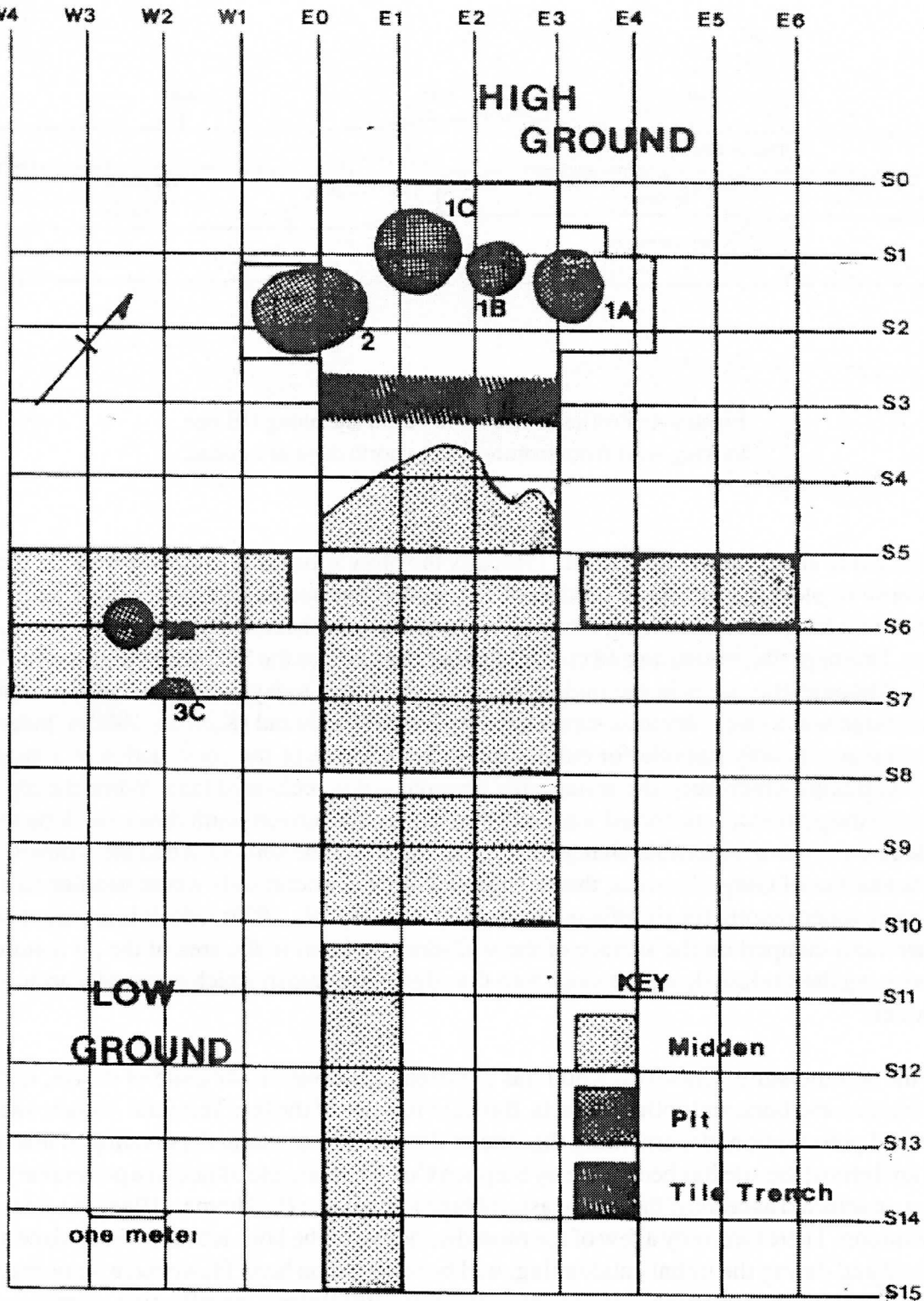


Figure 3: Plan of the 1979 excavations at Crawford Knoll, showing location of features, midden and modern drainage tile. (Reproduced from Kenyon, 1980c)

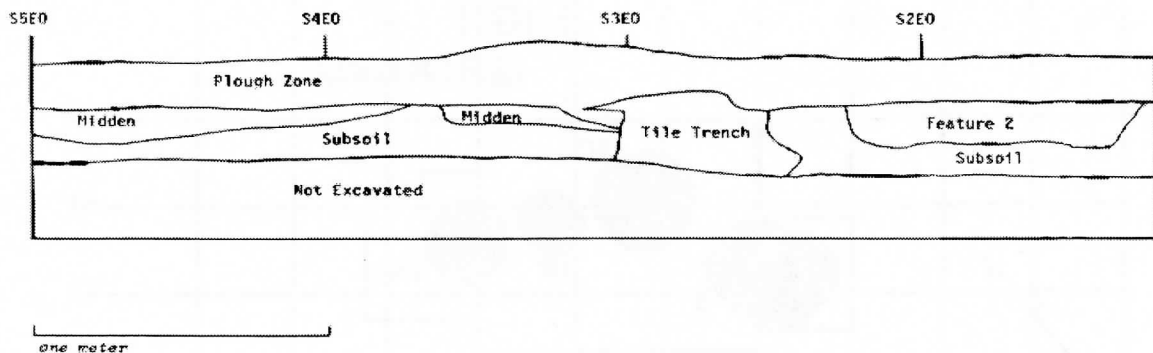


Figure 4: Profile of Crawford Knoll site along OE line looking west from feature area to north dege of midden.

Today the entire site is under cultivation. Typically the plow zone ranges from between 17 cm to 26 cm. Because of plowing, the upper portion of the deposit has been destroyed, including any traces of what would have been the living floors. The field has also been extensively tiled for drainage purposes. Drainage tile, measuring 48 cm in diameter, runs across the S3 line of the grid (see Figures 3 and 4). Although the site is in the middle of a ploughed field today, when the site was inhabited, the knoll/ridge was a small dry area surrounded by a reed marshland (Kenyon, 1980b). Indeed, the surrounding area is only suitable for cultivation today because of the construction of a large dike system and pumps which keep the water table lowered – it is reclaimed land. While the top of the knoll where the pit features occurred was well-drained, as one moved south down the slope towards the midden there was a noticeable change in the appearance of the soils such that the sediments took on characteristics of Gleysolic soils; that is “poorly drained mineral soils whose profiles reflect the influence of waterlogging for significant periods” (Clayton et al., 1977:136). It is apparent that the site inhabitants camped on the surface of the well-drained knoll in the area of the pit features and were throwing their refuse down the slope into the edge of the marsh which eventually accumulated as a midden.

Due to the soil moisture, Crawford Knoll has excellent preservation for a site of its age, including faunal remains and bone and antler artifacts. Because it is one of the few Terminal Archaic sites with good faunal preservation, documenting this site in detail is key to our understanding of this period. Faunal analysis of the site has been done by Stephen Cox Thomas, and although a preliminary report focusing on selected aspects of the faunal assemblage is available (S. Thomas, 1988), his final report is forthcoming. Therefore, only a few of the most distinctive of the bone artifacts, recognized as such in the field and during the initial cataloguing, will be reported on here. However, a number of other modified bone objects, most of which were non-descript with minimal modification, were discovered during the faunal analysis (Stephen Thomas: personal communication, 1999).



Figure 5: Ian Kenyon (at left) supervising cleaning of subsoil midden looking south, Crawford Knoll site, August 1979. Baulks in foreground extending to viewer show thickness of midden after ploughzone removed.

Given the small area that was excavated, Crawford Knoll also has an excellent sample of stone artifacts, which will be the primary focus of this paper. Among other lithics, the site yielded 16 notched projectile points of the Crawford Knoll type and one Ace-of-Spades point (Kenyon, 1980b). The site was most likely a warm weather habitation (Kenyon, 1980b; Ellis et al., 1990).

ARTIFACTS

Chipped Stone Artifacts

Projectile Points

In all, 17 projectile points were recovered (Figure 6). Eleven were collected from the surface and six from the excavations including one recovered from feature 2 and four from the midden. The metrics and raw materials for each point are listed in an Appendix. Chert types include sources from both Ontario (Kettle Point and Onondaga chert) and Michigan (Bayport and Stoney Creek). Kettle Point chert, however, is the dominant raw material for the points. All but one of the points conform to a single style, the Crawford Knoll type, which has been described in KEWA (Kenyon, 1980a).

These are generally very small, sometimes serrated, side- to corner-notched forms. The other point recovered, the lone example on Stoney Creek chert, is representative of the Ace-of-Spades type and may be a specialized spear or knife.

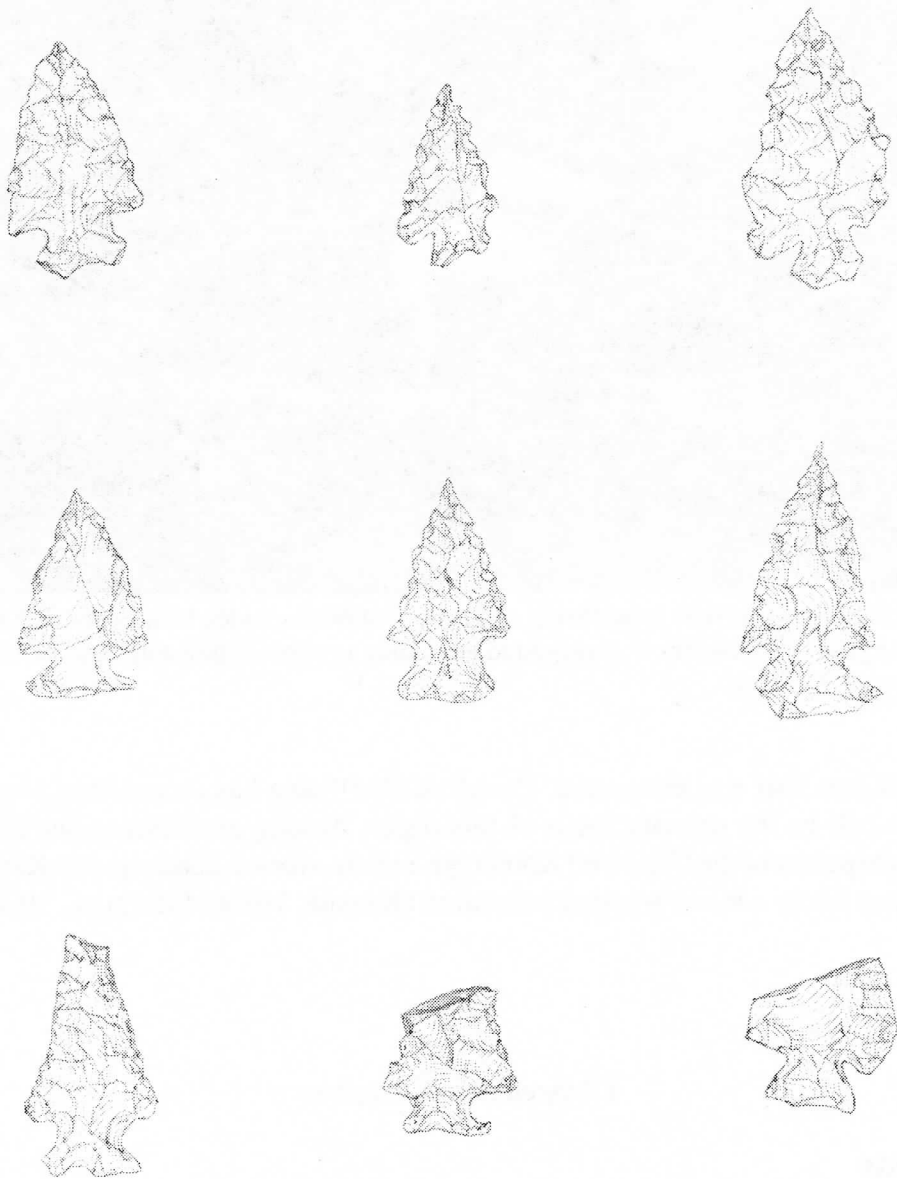


Figure 6: Crawford Knoll site points. Shown at actual size.

Crawford Knoll points are part of a distinctive Small Point horizon encompassing the Lower Great Lakes region. They are similar to points found throughout the lower Great Lakes and American Midwest. In Ontario, similar points have been found in the lower levels of Knechtel I site (Wright,

1972) and at Rocky Ridge (Ramsden, 1976). Virtually identical points have been found in the Haldimand complex burials of the Bruce Boyd site (Spence and Fox, 1986; Spence et al., 1978) and at Parkhill (Ellis, 1998; Snarey, 2000). There are also strong similarities to points found in the Terminal Archaic level of the Weber I site (Lovis and Robertson, 1989). Point types representative of the Riverton Culture in Illinois, particularly Merom expanding stem and Trimble side-notched types (Winters, 1969) closely resemble Crawford Knoll points as well.

Based on ethnographic specimens, Bradbury (1997), Shott (1997), D. Thomas (1978) and others have developed formulae to distinguish spear/dart from arrow tips. Their application to the Crawford Knoll points clearly show that these points were actually used on arrow tips (Snarey 2000), supporting the preliminary observations made by Kenyon many years earlier (1980c). As such, the Crawford Knoll points are the earliest well-documented evidence for use of the bow and arrow reported from southern Ontario.

Preforms

Eight preforms were found at Crawford Knoll (see Ellis et al., 1990: Figure 4.25a-d); six were surface collected and two came from the excavations, including one from Feature 2. The material for the preforms is the same as that used for projectile points, with Kettle Point being the dominant material. A summary of metric attributes for each preform is presented in Table 1.

Table 1: Metrics for preforms found at Crawford Knoll.

No.	Location	Material	Length*	Width	Thickness	Basal Width	Basal Height*
1	surface	Kettle Point	28.3	22.1	6.3	2.0	5.8
2	surface	Kettle Point	32.4	19.5	6.5	13.7	3.0
3	surface	Kettle Point	37.0	21.1	6.6	11.5	12.3
4	surface	Bayport	35.9	20.4	8.2	14.4	5.2
5	surface	Kettle Point	28	24	6.5	n/a	n/a
6	surface	unknown	23	19	6.6	n/a	n/a
7	fea. 2	Bayport	33.9	25.4	9.3	19.7	7.2
8	plough-zone	Onondaga	40.1	17.1	6.9	9.4	14.8

*all measurements in mm; **measures the distance between the base and the axis of maximum width (following Montet-White, 1967).

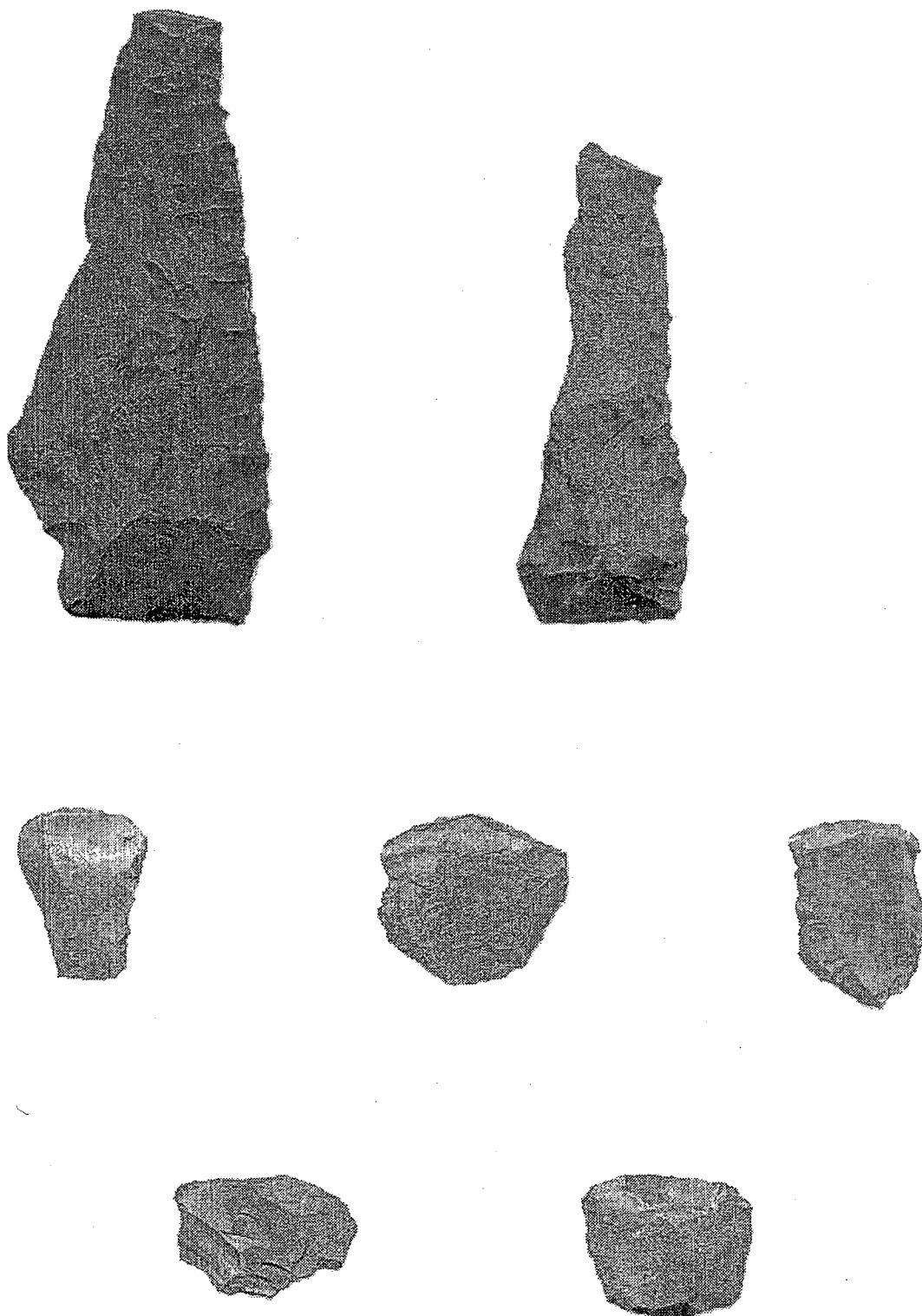


Figure 7: Stemmed bifaces (upper) and scrapers from Crawford Knoll. Actual size.

Scrapers

Five end scrapers were found at the site, two on the surface, two during excavations, and one recovered during flotation (see Figure 7, lower). Four are of the “thumbnail type” and the fifth is worked on all four edges. Again Kettle Point chert is the predominant material. A summary of metrics of the thumbnail scrapers is included in Table 2. Table 3 gives the working edge metrics for the fifth scraper, that was worked on multiple edges.

Table 2: Metrics for Scrapers from Crawford Knoll

No.	Location	Material	Length*	Width	Thickness	Edge Length	Edge Height	Bit Angle
1	surface	Kettle Point	19.7	14.5	3.2	11.1	2.8	76
2	midden	Kettle Point	19.8	19.6	4.7	16.9	3.8	77
3	surface	Onondaga	21.4	14.1	4.2	14.1	4.0	77
4	surface	Onondaga	14.1	20.3	3.8	19.0	3.8	74
5	midden	Kettle Point	17.8	16.0	5.4	see Table 3		

*all measurements in mm except bit angle, in degrees;

Table 3: Metrics for edges of scraper that has been worked on all four edges (no. 5 in table 2).

Edge	Worked Face	Edge Length*	Edge Height	Bit Angle
1	ventral	16.0	5.4	81
2	dorsal	12.0	3.5	57
3	dorsal	12.5	2.9	67
4	dorsal	10.2	1.8	48

*all measurements in mm except bit angle, in degrees

Stemmed Biface

One incomplete straight stemmed biface was recovered (see Figure 7, top left). It is made from siltstone. The blade of the tool is remarkably asymmetrical and the retouch pattern suggests that it had been resharpened a number of times. The diagonal edge has been smoothed or ground. The base has also been ground. Measurements are as given in Table 4.

A fragment of a long biface on identical lithic material was also uncovered (Figure 7, top right). It exhibits similar retouch flaking to the stemmed biface. Neither specimen was found in context. The stemmed biface is similar in size, shape and material to a specimen found in association with a cache of points at the Bruce Boyd site (Spence et al., 1978: Fig.2f) and seem to be typical of these Archaic sites.

Biface Fragments

In addition to the bifaces noted above, three other fragments were recovered. They are presumably portions of formal tools, but are too small to be identified as such. One fragmentary biface is made on Kettle Point chert. It appears to be a projectile point that broke during the notching process and was found in the midden. Another is made on an unidentifiable chert, and has a patina. It was found on the surface. This item was likely the blade of a projectile point or knife. Finally, a drill tip made on Kettle Point chert was recovered from the heavy fraction during flotation. Its context is unknown.

Chipping Detritus

A total of 1623 flakes were recovered in the excavations. Debitage counts for the midden and features are shown in Table 5. Although a number of chert types are represented in the flaking debris, Kettle Point chert is the predominant material, a pattern also seen in the formal tools at the site.

Table 4: Metrics for Stemmed Biface from Crawford Knoll

Characteristic	Measurement
max. length	69.5*
max. width	27.7
max. thickness	6.8 (mid-blade)
shoulder width	25.6
shoulder height	9.5
stem width	20.5
stem thickness	5.1
base thickness	19.0

*in mm; **incomplete

Table 5: Chipping Detritus Count by Feature at Crawford Knoll

Feature	Number
Midden	1367
1A	25
1B	30
1C	133
2	55
3B	5
3C	8

Cores

Four cores were found at Crawford Knoll, all in the midden. Two are made on Kettle Point chert, one on Onondaga and the fourth is made on an unidentified chert.

Other Stone Artifacts

Netsinker

One limestone netsinker was found on the surface. The cobble is notched along both margins and its overall measurements are 114 mm by 74 mm by 31 mm. The two notches have widths of 27 mm and 26 mm. The internotch distance is 68 mm (I. Kenyon, 1980b).

Whetstone

One sheet of slate has one face that has been smoothed or abraded. It is broken at one end, and is 67 mm long, 70 mm wide and 7 mm thick. The whetstone was found in feature 2.

Hammerstone

A schist cobble was found on the surface of the site. The hammerstone facet extends over most of the tool's surface. I. Kenyon (1980b) has suggested some use as an anvil as well. Dimensions of the hammerstone are 103 mm by 68 mm by 37 mm.

Stone Bead

One tubular stone bead was found in feature 2. It is cylindrical in shape with a diameter of 6 mm. It is 11 mm in length.

Fire-Cracked Rock

A large amount of fire-cracked rock was present at the site, the majority of which was recovered during flotation. No patterning could be discerned for the fire-cracked rock over most of the site. However, both feature 1A and feature 2 (see Figure 3) did have concentrations of fire-cracked rock present.

Artifacts of Bone, Tooth and Antler

Bipointed Bone Implements

Four bipointed bone implements were found in the midden (see Figure 8). All were made from longbone splinters. Typically, one end is more sharply pointed and more highly ground than the other. Metric data for the bipointed implements is presented in Table 6. Artifacts of similar nature have been

given various names such as bone barbs (Wright, 1972), gorges (Winters, 1969), composite tool barbs (Ramsden, 1976), and spindle-shaped points (Kenyon, 1980b). A specific function for these barbs is unknown, but it is most often suggested that they were probably part of fishing gear (Ellis et al., 1990a: p.111; Winters, 1969; Wright, 1972). Similar specimens have been found on the Inverhuron Archaic sites of Knechtel I (Wright, 1972) and Rocky Ridge (Ramsden, 1976), although some are made on fishbone rather than from mammal longbones. They also resemble objects found on the Pacific Coast used by the Yuquot (Kenyon, 1980b, 1980c). There they have been interpreted as barbs from composite fish hooks.

Bone Tips

A number of bone tips have been found in the midden as well as in feature 2. I. Kenyon (1980b) noted five such artifacts, but S.C. Thomas (personal communication) has identified many more. These have ground tips at one end and are polished to a point, but are broken at the other. Some of these may be fragments of the bipointed bone objects discussed above, but others seem to be awls.

Table 6: Metrics for the Bipointed Bone Implements Found at Crawford Knoll.

Fig. No*	Length**	Width	Thickness
1	63	8	5
2	61	10	7
3	52	7	6
4	36	7	5

*refers to figure 8 left to right; **all measurements in mm

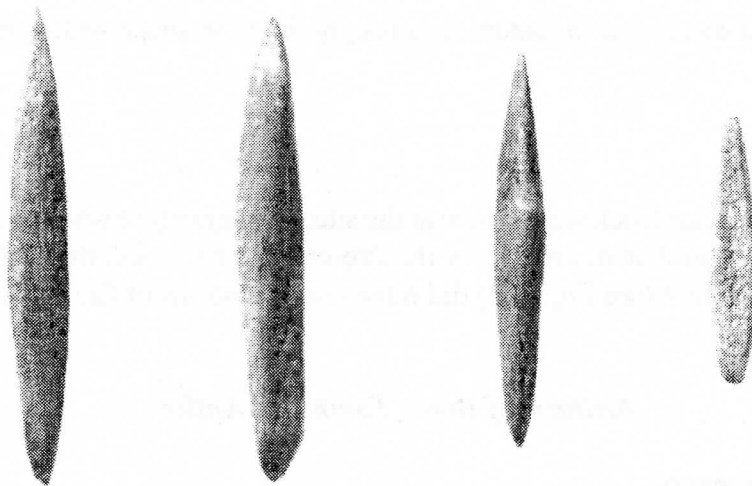


Figure 8: Bipointed bone implements from Crawford Knoll. Shown at actual size. (Photo courtesy of London Chapter OAS).

Bone Beads

Two bone beads were recovered from the site. A mammal bone bead was recovered from the midden. It measures 18 mm long, 13 mm wide and 9 mm thick. A bird bone bead was found in Feature 1B. It is broken longitudinally. The bead measures 24 mm in length and its estimated diameter is 5 mm.

Table 7: Comparison of Length of Crawford Knoll Bipointed Bone Implements to Those Found at Locations in Ontario and British Columbia

Site	No.	Range*	Mean	St. Dev.	Reference
Crawford Knoll	4	36-63	53.00	12.30	Kenyon, 1980c
Knechtel I	25	33-69	48.46	n/a	Wright, 1972
Rocky Ridge	6	45-70	54.00	9.03	Ramsden, 1976
Yuquot (B.C.)	108	29-93	54.79	14.63	Kenyon, 1980c

*measurements in mm.

Canine Bead

One bead made on a canine tooth of a large mammal (bear??) was recovered from the surface. The hole was drilled near the apex of the root.

Antler Tools

Three possible tools of antler were found in the midden. The first is the basal section of an antler. It is cut at the distal end and measures 80 mm in length. It may be a flaker, however the exterior is weathered, obscuring any visible use-wear. The second specimen is an antler tine measuring 106 mm. It has been broken at the proximal end. It has coarse striations along its sides, although the tip itself is unmodified. It may have been used as a punch. Finally, one fragmentary specimen with a carved barb was found. It may be part of a barbed projectile point or from a harpoon.

FEATURES

Midden

A thin continuous layer of black soil representing the midden is located in the central and south excavated portions. It is located along the slopes of the knoll, suggesting that refuse was discarded along the hillsides. The midden has no visible signs of stratification. On average, the thickness of the midden is about 10 cm, but some has been removed by plow, indicating that originally it was much thicker. The deposit was filled with chipping detritus, bone and fire-cracked rock.

Table 8: Attributes of Pit Features Found at Crawford Knoll

Six pit features (e.g. Figure 9) were uncovered during the excavations, four located at the top of the knoll, and the other two downslope (Figure 3). Pit attributes are listed in Table 8.

Two discrete classes of pit have been distinguished by Kenyon (1980a). Large pits with flat bottoms (features 1A, 1C and 2) and small, basin shaped pits (features 1B, 3B, and 3C). All pits have dark fill similar to the midden soil. As seen in the midden, associated artifacts include bone, chipped stone, and fire-cracked rock. However, no significant amounts of fire-cracked rock were found associated with any of the features, nor was there any noticeable fire-reddening of the surrounding soil, suggesting that none of the features are hearths.

Fea. No.	Length	Width	Depth	Profile
1A	98	96	11	flat bottom
1B	57	57	29	basin
1C	150	124	21	flat bottom
2	139	101	18	flat bottom
3B	65	53	19	basin, under midden
3C	n/a	n/a	21	basin, under midden

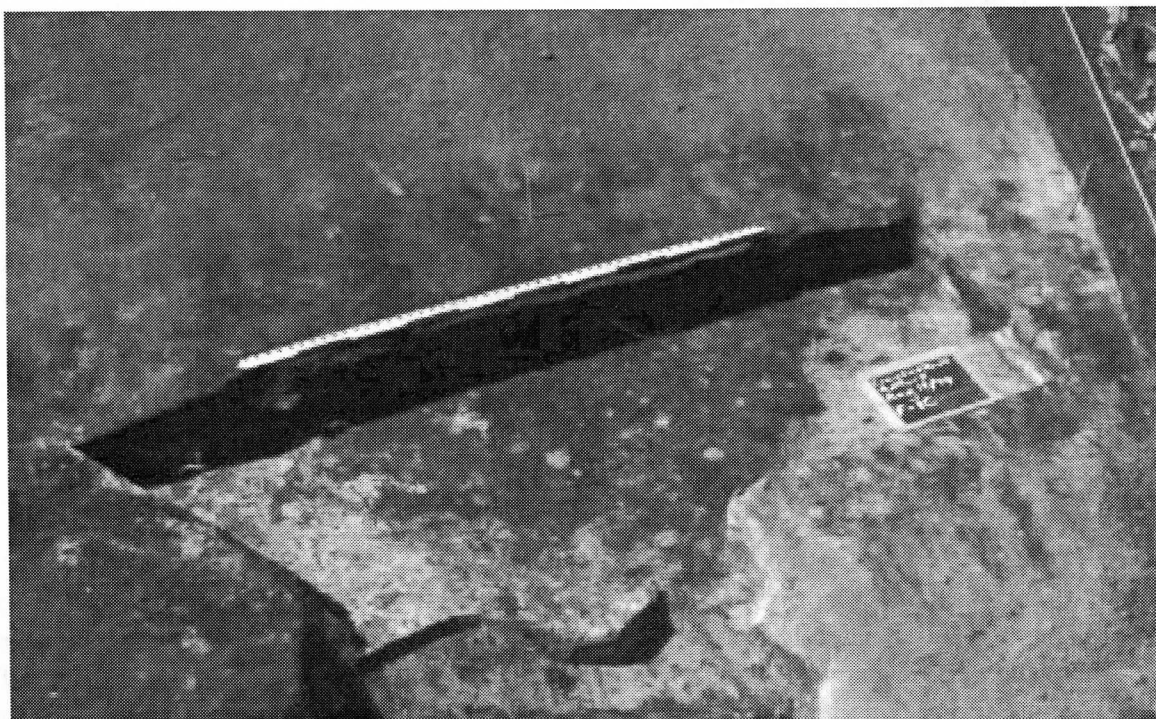


Figure 9: View of partially excavated Feature 1C looking west.

FLORAL MATERIAL

Flotation failed to produce any significant quantity of carbonized plant remains. Most of the recovered floral material was nutshell, possibly walnut. Nutshell was present in all three large flat-bottomed pits (Features 1A, 1C, and 2) as well as in at least one midden square (S4E1). Porous plant remains, such as wood, did not preserve well at the site.

FAUNAL MATERIAL

Crawford Knoll exhibits excellent faunal preservation for site of its age in Ontario. In fact, it has yielded one of the largest Late Archaic faunal assemblages in the eastern Great Lakes area. A large and diverse amount of faunal material, totalling just over 12 kg (S. Thomas, 1988), was found in the excavations. Deer, raccoon, freshwater drum, sturgeon, Blanding's turtle, and black duck were recovered from the surface (Cooper, 1980). Faunal remains from the excavations include mammals such as deer, bear, dog, raccoon, bobcat, lynx and muskrat. Most were recovered from the midden. Fish, including freshwater drum, bowfin, gar, sucker, catfish, pike and walleye were also recovered from the excavations. Bowfin and freshwater drum were particularly common. The presence of both lake-dwellers and migratory spawning fish indicate a varied subsistence base.

SEASONALITY, SUBSISTENCE AND SETTLEMENT PATTERNS

Seasonality of the Crawford Knoll site has been the subject of debate since its excavation. Originally, Ian Kenyon (1980b) argued that the site represented a fall base camp occupation, indicated by the presence of walnut shell. The subsequent recognition that deer made up almost 60 percent of the identified mammal remains (by number of identified bones; S. Thomas, 1988) could also be argued to be consistent with the stereotype of the importance of deer hunting in the fall (e.g. Ellis et al., 1990:114). However, Kenyon (1980b) did not rule out the possibility of occupation in other seasons.

More recent evidence also suggests a spring through summer occupation(s) (Ellis et al., 1990:114; Spence and Fox, 1986:8). Muskrat make up 25 percent of the fauna which is more than is typical for Late Archaic sites (S. Thomas, 1988). Based on epiphyseal fusion, Thomas obtained age estimates to study the population structure for the muskrats at Crawford Knoll. He concluded that muskrat exploitation was limited to early spring, and was used as a lean-season food resource. There are also a number of fish types found at Crawford Knoll as well, but they include primarily bowfin and freshwater drum. These are species which are most easily taken in shallow waters in the spring through fall (Ellis et al., 1990:114).

Given the floral and faunal data, a more complex picture of seasonal use is emerging. The high quantities of the muskrat and deer, as well as the presence of nuts and the dominance of bowfin and freshwater drum, indicate that the site may have been occupied throughout the warmer parts of the year from early spring through to fall and Kenyon favoured this interpretation in 1990 (see Ellis et al., 1990:112). Crawford Knoll is close to a variety of environments, so that it might be attractive for occupation through the whole season without moving, and this could be taken indicative of a less

mobile lifestyle (see Woodley, 1990). However, it is also possible that the site was used on and off or only periodically throughout the warmer months. For example, Kenyon (in Ellis et al. 1990:114-115) argued for aggregation of Terminal Archaic populations in the early spring along major rivers to intercept spring spawning fish such as sucker and walleye and to carry out mortuary activities at small cemeteries which would imply abandonment of a site like Crawford Knoll for at least part of the early spring. It is also possible that the site could be used at different seasons from year to year such as early spring in one year, summer in another or that different sub-groups like families could have behaved differently at the same seasons in any given year. Indeed, ethnographic data do indicate foragers had considerable flexibility or choices and did not always slavishly follow the same seasonal round from year to year (e.g. Jochim, 1991). More Archaic sites with good organic preservation need to be located and excavated in order to fully understand these settlement systems. Regardless of exact seasonal use, the relatively small size of the habitable area suggests the site was only used by small groups and Kenyon (in Ellis et al., 1990:112) suggested that "site populations were limited to those of microband size."

SUMMARY

Crawford Knoll is a Late Archaic site occupying a low sand ridge, which at the time of its occupation was surrounded by marshland. The ridge of the knoll was the habitation area and refuse was discarded along the slopes of the knoll forming an extensive hillside midden. The site has been dated to approximately 3,400 BP by radiocarbon, has good preservation of bone and antler refuse and artifacts, and has evidence suggestive of use throughout the warmer months. A number of small notched projectile points were recovered. These have an affinity to points recovered in the Midwestern United States and with other sites in Ontario dating to the same time and provide good evidence of the use of the bow and arrow by at least the 3500 to 3000 B.P. time period.

Acknowledgements: The core of this paper is based on an unpublished manuscript prepared by the late Ian Kenyon (1980b). The 1979 Crawford Knoll site excavation crew included: Randy Johnston, Chris Ellis, Gary Foster, Ian Kenyon and Andrew Mitchell. Thanks to Neal Ferris for allowing me (Kristen Snarey) access to the collections for purposes of analysis, Stephen Cox Thomas for information on the fauna, and to Mike Spence and Chris Ellis for their comments on earlier drafts of this paper. As well, thanks to Chris Ellis for providing the photos of the site excavations and feature included herein.

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APPENDIX: Projectile Point Measurements

Cat. No.	Weight (g)	Length (mm)	Thickness (mm)	ShoulderWidth (mm)	Neck Width (mm)	Base Width (mm)	Material	Flake Blank Remnants*	Serrations
sur-80	3.60	37.2	6.4	20.5	8.4	10.3	Bayport	yes	yes
sur-80	2.80	---	6.1	18.2	10.0	13.2	Bayport	yes	no
sur-80	1.32	24.0	4.7	14	7.6	8.8	Kettle Point	yes	yes
sur-80	3.40	30.6	6.4	17.9	10.2	12.3	Onondaga	yes	yes
sur-80	---	---	4.0	20.2	9.1	12.4	Kettle Point	yes	---
sur-79	---	---	5.0	18.1	8.8	11.9	Kettle Point	yes	---
sur-79	---	---	---	---	---	---	Onondaga	---	yes
sur-80	---	57.1	6.1	30.1	14.6	18.3	Selkirk	no	no
80-74	---	---	5.2	22.4	---	---	Bayport	no	no
78-22	4.15	37.8	6.9	18.8	11.2	---	Bayport	yes	yes
S7-W2	---	---	---	---	---	---	Onondaga	---	no
S6-E0	---	---	---	---	10.6	14.2	unidentified	---	---
F-2	---	---	---	---	10.3	12.9	unidentified	---	---
78-23	2.90	2.9.	7.1	16.1	10.0	12.9	Kettle Point	no	yes
sur-79	1.41	27.6	4.2	16.3	8.2	14.0	Kettle Point	yes	no
Unit B	---	---	---	---	---	15.7	Kettle Point	yes	---

*several points retain flat unflaked surfaces and other characteristics on the finished product indicating they were made on small flakes only slightly larger than the completed points.